dahlia. After an immersion of from half an hour to three or four hours, or even much longer, depending on the strength of the solution, it will be found that in many cases the nuclei are more or less deeply colored; and that the cell is not killed is evinced by the continuance of the protoplasmic streaming. It is quite surprising to see how deeply the nucleus is often stained without killing the cell. A nucleus so colored appears perfectly normal, there being no distortion or change beyond the change in color. As yet I have not studied especially what parts of the nucleus are colored, but it appears to be the nucleolus and microsomes only, as in the case of cells that have first been killed and then stained according to the ordinary methods.

Among other objects that have given more or less satisfactory results were the hairs from the base of the perianth of Lilium bulbiferum; stamen-hairs of Aspleodelus albus; leaves of Elodea Canadensis and Vallisneria spiralis; root-hairs of Trianea Bogatensis, Cucurbita Pepo, Tradescantia zebrina; spermatozoids of Chara and a fern (probably Blechnum). In all cases cells were chosen in which there was evident protoplasmic movement, in order that there might be a certain means of determining whether or not the cell was still living.

Similar and usually quite as good results were also obtained with mauvein and methyl-violet, both colors closely resembling dahlia. Usually a .1% solution was made, and this diluted with from 50 to 1,000 parts of water, according to circumstances. Some doubtful results were obtained with other colors, but too uncertain to warrant recording.—Douglas H. Campbell, *Tübingen.*

The absorption of aniline colors by living cells.—About a year ago Pfeffer[1] published the results of a rather extended series of experiments showing that, contrary to the ordinarily accepted idea, various aniline colors can be absorbed in large quantities by living cells. I wish here merely to call attention to some easily made but instructive experiments bearing on the subject. Pfeffer's experiments were mostly made with methylen-blue and methyl-violet, though numerous other colors were also tried. Among colors not employed by him I found that dahlia and mauvein, both very similar to methyl violet, were quite as good and acted much in the same way. The yellow color chrysoidin also gave good results. No very satisfactory results were obtained with red pigments, though in some cases safranin, tropœolin and fuchsin gave tolerably good coloring, but either it was too diffuse, or the cell-wall was more deeply colored than the contents.

With methylen-blue either the cell-sap is colored, often very intensely, e. g., root-hairs of Trianea Bogatensis, or a precipitate is formed in the cell-sap, e. g., Spirogyra. If vesicles of tannic acid are present, as is the case

[1] Untersuchungen aus dem botan. Institut in Tübingen, 1886. "Uber Aufnahme von Anilinfarben in lebende Zellen."

in Zygnema, these are colored dark blue. Methyl-violet, dahlia and mauvein color the protoplasm and nucleus, and are specially valuable in the study of the latter. In some cases they are also precipitated in the cell-sap. Chrysoidin appears to color only the protoplasm. The following are some of the objects that were used: root-hairs of Trianea Bogatensis, Cucurbita, Tradescantia zebrina; stamen-hairs of various species of Tradescantia; Spirogyra spp., Zygnema spp.; roots of Lemna minor; leaves of Elodea (Anacharis) Canadensis, Vallisneria spiralis; pollen-tubes of Hemerocallis spp., Tradescantia Virginica, Scilla spp.; spermatozoids of Chara.

The objects are placed in a solution varying from .002 % to .001 %, varying with the nature of the cell-wall and the time of immersion. Root-hairs are usually especially delicate, and the solution should be very dilute or the immersion very brief.

In most cases objects were selected where there was marked protoplasmic streaming, as this is the best means of determining whether the cell is alive or not. It is surprising how deeply the protoplasm or nucleus may be stained without materially affecting the streaming. For a demonstration of the staining of the protoplasm the root-hairs of Trianea were found to be specially favorable on account of their large size and the rapid streaming, as well as the readiness with which the color is absorbed.—DOUGLAS H. CAMPBELL, *Tübingen.*

H. W. Ravenel.—Henry William Ravenel died at Aiken, S. C., July 17th. This is indeed sad news to all American botanists, for among their number there was none more respected and beloved and few whose scientific work covered so long a period. He was born in the parish of St. John's, Berkley, S. C., May 19, 1814. After receiving the usual high school training he entered the South Carolina College, and graduated with distinction in 1832. He then became a planter, and resided at St. John's for twenty years. In 1835 he was married to Miss Elizabeth Gilliard Snowden, of St. John's. His wife died in 1855, leaving a family of six children, four of whom still survive. In 1858 he married Miss Mary Huger Dawson, of Charleston, who, with five children, all daughters, survives to mourn their irreparable loss. In 1853 he removed to Aiken, S. C., where the remaining years of his life were spent. Although an active worker until the close of his life, when he suffered from a long illness following an attack of apoplexy, he was, unfortunately, for many years, afflicted with a deafness which was, at last, so great that he could hardly converse with strangers.

Mr. Ravenel was born with a fondness for natural history, and he pursued his studies in botany with enthusiasm during the whole of his long life. As a young man he explored minutely the region about St. John's, and he was equally active after his removal to Aiken. There was not a group of plants, no matter how small, which escaped his observation.